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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/579,576	05/25/2000	Ho-Jin Kweon	003364.P048	7384

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Blakely Sokoloff Taylor & Zafman LLP  
12400 Wilshire Boulevard 7th Floor  
Los Angeles, CA 90025-1026

EXAMINER

WILLS, MONIQUE M

ART UNIT	PAPER NUMBER
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1746

DATE MAILED: 10/05/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/579,576

Applicant(s)

KWEON ET AL.

Examiner

Monique M Wills

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 23 August 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1,3-35 and 37 is/are pending in the application.
- 4a) Of the above claim(s) 10-15 and 23-28 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,3-9,16-22,29-35 and 37 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 25 May 2000 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
  - 2) ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date: _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                    | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date: _____ | 6) <input type="checkbox"/> Other: _____  |

**DETAILED ACTION**

***Request for Continued Examination***

A Request for Continued Examination (RCE) under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on August 16, 2004 has been entered.

The following rejections are overcome:

- Claims 1-7, 16,17,20,21,29,30,33 & 34 under 35 U.S.C. 102(b) as being anticipated by Miyasaka U.S. Patent 5,869,208.
- Claims 1-7, 16, 17, 20, 21, 29, 30, 33 & 34 under 35 U.S.C. 103(a) as being unpatentable over Saidi et al., U.S. Patent 5, 851,696 in view of Gan et al., U.S. Patent 6,153,338.
- Claims 22 & 35 under 35 U.S.C. 103(a) as being unpatentable over Saidi et al., U.S. Patent 5, 851,696 in view of Gan et al., U.S. Patent 6,153,338 and further in view of Matsubara U.S. Pub. 2001/0010807.
- Claims 1-9, 16-19 & 29-32 under 35 U.S.C. 103(a) being unpatentable over Goshio et al. U.S. Patent 6,589,69490 in view of Gan et al. U.S. Patent 6,153,338.

Claims 1, 3-9, 16-22, 29-35 & 37 are newly rejected as follows:

- Claims 1, 3-7, 16, 17, 20, 21, 29, 30, 33, 34 & 37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Miyasaka U.S. Patent 5,869,208, in view of Gan et al., U.S. Patent 6, 717,729
- Claims 1, 3-7, 16, 17, 20, 21, 29, 30, 33, 34 & 37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Saidi et al., U.S. Patent 5, 851,696 in view of Gan et al., U.S. Patent 6,171,729.
- Claims 22 & 35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Saidi et al., U.S. Patent 5, 851,696 in view of Gan et al., U.S. Patent 6,171,729 and further in view of Matsubara U.S. Pub. 2001/0010807.
- Claims 1, 3-9, 16 -19 & 29-32 are rejected under 35 U.S.C. 103(a) being unpatentable over Goshō et al. U.S. Patent 6,589,69490 and further in view of Gan et al. U.S. Patent 6,171,729.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 3-7, 16, 17, 20, 21, 29, 30, 33, 34 & 37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Miyasaka U.S. Patent 5,869,208, in view of Gan et al., U.S. Patent 6,717,729.

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With respect to claims 1 & 5, Miyasaka teaches a physical mixture of a lithiated transition metal compound (col. 11, lines 10-20), a powder metal including *aluminum* (col. 8, lines 10-15), a carbon black conductive agent (col. 8, lines 5-10), a binder (col. 8, lines 30-45) and an organic electrolyte solution (col. 8, lines 48-53). With respect to claims 3 & 7, the active material includes  $\text{LiCoO}_2$ , embracing formula 7, when B is Co and A is O (col. 5, lines 15-25). With respect to claims 4 & 6, the metal additive is 2 to 15 wt % of the active material (col. 8, lines 15-20). With respect to claims 16, 17, 29 & 30, the active material includes  $\text{LiCoO}_2$  embracing  $\text{LiBA}_2$  and  $\text{LiBO}_{2-z}\text{A}_z$  when B is Co and A is O (col. 8, lines 15-25). With respect to claims 20, 21, 33 & 34, the active material is  $\text{LiCoNiO}_2$ , embracing  $\text{LiNiCoA}_2$  and  $\text{LiNiCoO}_{2-z}\text{A}_z$  when A is oxygen (col. 8, lines 15-25).

Miyasaka is silent to an electrode additive of at least one of Si, B, Ti, Ga, Ge, Ca, Mg, Sr and Ba (claims 1, 5 & 37).

However, Gan teaches the equivalence of aluminum and titanium metallic powder as conductive agents in cathode mixtures of lithium transition metal oxides for improving electrode conductivity (claims 1, 5 & 37). See column 4, lines 15-30.

Miyasaka and Gan are analogous art, because they are from the same field of endeavor, namely, fabricating lithium transition metal oxide cathodic materials for lithium electrochemical cells.

Therefore, the subject matter as a whole would have been obvious to one having ordinary skill in the art at the time the instant invention was made because even though Miyasaka does not teach titanium conductive agents, Gan teaches that aluminum and titanium are art recognized equivalent materials for use as conductive agents in lithium transition metal oxide cathodic materials, and therefore one having ordinary skill in the art would have

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substituted one conductive agent for the other.

*Claim Rejections - 35 USC § 103*

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 3-7, 16, 17, 20, 21, 29, 30, 33, 34 & 37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Saidi et al., U.S. Patent 5, 851,696 in view of Gan et al., U.S. Patent 6,171,729.

Saidi teaches a rechargeable lithium battery (abstract). With respect to claims 1 & 5, Saidi teaches a slurry composition comprising: a physical mixture of a positive active material including  $\text{LiMnO}_4$ ,  $\text{LiCoO}_2$ ,  $\text{LiNiO}_2$ ,  $\text{LiNiVO}_4$ ,  $\text{LiCoVO}_4$ ,  $\text{LiCoNiO}_2$  or  $\text{LiTmO}_2$  where Tm is a transition metal or combination of transition metals (col. 6, lines 10-20); a binder (col. 9, lines 10-15); a carbon conductive agent (col. 9, lines 15-20); and an organic solvent (col. 9, lines 65-68); coated onto a current collector and dried (col. 9, lines 15-21 & 60-68). With respect to claims 3 & 7, the positive active material includes  $\text{LiCoO}_2$  (instant formula 3),  $\text{LiNiO}_2$  (instant formula 3) or  $\text{LiCoNiO}_2$  (instant formula 11). See column 6, lines 10-20. With respect to claims 16 & 29, the active material is  $\text{LiCoO}_2$  embracing the formula  $\text{Li}_x\text{BA}_2$  when  $x=1$  and A is oxygen (col. 6, lines 10-20). With respect to claims 17 & 30, the active material is  $\text{LiCoO}_2$  embraces the formula  $\text{Li}_x\text{BO}_{2-z}\text{A}_z$  when  $x=1$  and A is oxygen (col. 6, lines 10-20). With respect to claims 20 & 33, the active material is  $\text{LiCoNiO}_2$ , embraces the formula

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$\text{Li}_x\text{NiCoA}_2$  when  $x=1$  and A is oxygen (col. 6, lines 10-20). With respect to claims 21 & 34, the active material is  $\text{LiCoNiO}_2$ , embraces the formula  $\text{Li}_x\text{NiCoO}_{2-z}\text{A}_z$  when  $x=1$  and A is oxygen (col. 6, lines 10-20).

Saidi is silent to an electrode additive of at least one of Si, B, Ti, Ga, Ge, Ca, Mg, Sr and Ba (claims 1, 5 & 37), in an amount of 0.01 to 10wt% (claims 4 & 6).

However, Gan teaches that it is conventional to employ titanium conductive agents in lithium transition metal oxide positive electrodes to improve conductivity of the electrode (claims 1, 5 & 37). See column 4, lines 15-30. With respect to claims 4 & 6, the conductive agent may be added in an amount up to 10% by weight (col. 4, lines 15-30).

Saidi and Gan are analogous art because they are from the same field of endeavor, namely, fabricating rechargeable lithium cells.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the instant invention was made to employ the titanium conductive agent of Gan in the positive electrode of Saidi, in order to increase conductivity of the positive electrode.

### *Claim Rejections ~ 35 USC § 103*

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 22 & 35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Saidi et al., U.S. Patent 5, 851,696 in view of Gan et al., U.S. Patent 6,171,729 and further in view of Matsubara U.S. Pub. 2001/0010807.

Saidi in view of Gan teach a positive active slurry composition as described hereinabove. Saidi teaches a positive active material comprising  $\text{LiTmO}_2$ , where Tm is a combination of transition metals (col. 6, lines 15-20).

Saidi does not expressly disclose a lithium nickel/cobalt material of the formula  $\text{Li}_x\text{Ni}_{1-y-z}\text{Co}_y\text{M}^n\text{A}_2$ .

However, Matsubara teaches that it is conventional to employ lithium nickel/cobalt oxides of the formula  $\text{Li}_y\text{Ni}_{1-x}\text{Co}_x\text{M}_x\text{O}_2$  where M is Al, Fe, Mn where y is  $0.9 < y < 1.3$  and  $0 < x < 0.5$  (§ 13-14). This compound improves the charging and discharging cycle characteristics of the positive electrode so that it retains high battery capacity (abstract).

Therefore, the invention as a whole would have been obvious to one of ordinary skill in the art at the time the instant invention was made, because even though Saidi does not specifically teach  $\text{Li}_x\text{Ni}_{1-y-z}\text{Co}_y\text{M}^n\text{A}_2$ , Matsubara teaches that material of this formula improves the charging and discharging cycle characteristics and battery capacity.

### *Claim Rejections - 35 USC § 103*

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.



Claims 1, 3-9, 16 -19 & 29-32 are rejected under 35 U.S.C. 103(a) being unpatentable over Gosho et al. U.S. Patent 6,589,69490 and further in view of Gan et al. U.S. Patent 6,171,729.

Gosho teaches a positive active material comprising  $\text{LiCoO}_2$ ,  $\text{LiNiO}_2$ ,  $\text{LiCo}_{1-x}\text{Ni}_x\text{O}_2$ , wherein  $0.1 < X$  and  $Y < 0.1$  (col. 6, lines 15-23). With respect to claims 1 & 5, The active material is prepared by mixing a binder, carbon black and N-methyl-z-pyrrolidone to form a slurry (col. 19, lines 45-55), the slurry is applied onto both surfaces of a current collector and dried (col. 19, lines 45-55). With respect to claims 3 & 7, the positive active material includes  $\text{LiCoO}_2$  (instant formula 3),  $\text{LiNiO}_2$  (instant formula 3) or  $\text{LiCoNiO}_2$  (instant formula 11). See column 6, lines 15-23. With respect to claims 8 & 9, the organic solvent is N-methylpyrrolidone (col. 19, lines 50-55). With respect to claims 16 & 29, the active material is  $\text{LiCoO}_2$  embracing the formula  $\text{Li}_x\text{BA}_2$  when  $x=1$  and A is oxygen (col. 6, lines 15-23). With respect to claims 17 & 30, the active material is  $\text{LiCoO}_2$  embracing the formula  $\text{Li}_x\text{BO}_{2-z}\text{A}_z$  when  $x=1$  and A is oxygen (col. 6, lines 15-23). With respect to claims 18, 19, 31 & 32, the active material is  $\text{LiNi}_{1-x}\text{Al}_x\text{O}_2$ , embracing the formula  $\text{Li}_x\text{B}_{1-y}\text{M}''_y\text{A}_z$  when B is Ni,  $\text{M}''$  is Al and A is O (col. 6, lines 15-23).

Gosho is silent to an electrode additive of at least one of Si, B, Ti, Ga, Ge, Ca, Mg, Sr and Ba (claims 1 & 5) in an amount of 0.01 to 10 wt% (claims 4 & 6).

However, Gan teaches that it is conventional to employ titanium conductive agents in lithium transition metal oxide positive electrodes to improve conductivity of the electrode (claims 1 & 5). See column 4, lines 15-30. With respect to claims 4 & 6, the conductive agent may be added in an amount up to 10% by weight (col. 4, lines 15-30).

Gosho and Gan are analogous art because they are from the same field of endeavor, namely, fabrication rechargeable lithium cells.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the instant invention was made to employ the titanium conductive agent of Gan in the positive electrode of Gosho, in order to increase conductivity of the positive electrode.

*Response to Arguments*

Applicant's arguments, see pages 11-12 filed August 16, 2004, with respect to Miyasaka being silent to a cathode additive of at least one of Si, B, Ti Ga, Ge, Ca, Mg, Sr and Ba have been fully considered and are persuasive. The 35 U.S.C. 102(b) rejection of claims 1-7, 16,17,20,21,29,30,33 & 34 as being anticipated by Miyasaka U.S. Patent 5,869,208 has been withdrawn.

Applicant's arguments, see pages 13-14, filed August 16, 2004, with respect to Saidi being silent to a cathode additive of at least one of Si, B, Ti Ga, Ge, Ca, Mg, Sr and Ba have been fully considered and are persuasive. The rejection of claims 1-7,16,17,20,21,29,30,33 & 34 under 35 U.S.C. 103(a) as being unpatentable over Saidi et al., U.S. Patent 5, 851,696 in view of Gan et al., U.S. Patent 6,153,338 has been withdrawn.

Applicant's arguments, see pages 15-16, filed August 16, 2004, with respect to Saidi in view of Gan '338 being silent to a cathode additive of at least one of Si, B, Ti Ga, Ge, Ca, Mg, Sr and Ba have been fully considered and are persuasive. The rejection of claims 22 & 35 under 35 U.S.C. 103(a) as being unpatentable over Saidi et al., U.S. Patent 5, 851,696 in view of Gan

et al., U.S. Patent 6,153,338 and further in view of Matsubara U.S. Pub. 2001/0010807 has been withdrawn.

Applicant's arguments, see pages 16-17, filed August 16, 2004, with respect to Goshō being silent to a cathode additive of at least one of Si, B, Ti Ga, Ge, Ca, Mg, Sr and Ba have been fully considered and are persuasive. The rejection of claims 1-9, 16-19 & 29-32 under 35 U.S.C. 103(a) being unpatentable over Goshō et al. U.S. Patent 6,589,69490 in view of Gan et al. U.S. Patent 6,153,338 has been withdrawn.

#### *Conclusion*

Any inquiry concerning this communication or earlier communications from the Examiner should be directed to Monique Wills whose telephone number is (571) 272-1309. The Examiner can normally be reached on Monday-Friday from 8:30am to 5:00 pm.

If attempts to reach Examiner by telephone are unsuccessful, the Examiner's supervisor, Michael Barr, may be reached at 571-272-1414. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR.

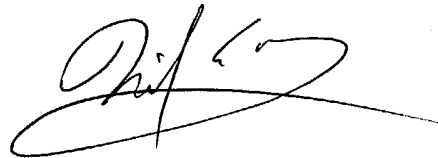
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Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

MW

10/01/04

**MICHAEL BARR**  
**SUPERVISORY PATENT EXAMINER**

A handwritten signature in black ink, appearing to read "Michael Barr", with a large, sweeping flourish extending from the end of the name.